Original Paper

Effect of human chorionic gonadotropin and vitamine E on cellular density of CA1 hippocampal area, learning ability and memory, following ischemia - reperfusion injury in mice

**Babahajian A (BSc)[1], Rasouli H (PhD)[2], Katebi M (PhD)[3]
Sarveazad A (MSc)[4], Soleimani M (PhD)*[5], Nobakht M (PhD)[6]**

[1]MSc Student of Anatomy, Cellular and Molecular Research Center, School of Medicine, Iran University of Medical Sciences, Tehran, Iran. [2]Assistant Professor, Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran, Iran. [3]Assistant Professor, Department of Anatomy, School of Medicine, Hormozgan University of Medical Sciences, Bandar-Abbas, Iran. [4]PhD Candidate in Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran, Iran. [5]Assistant Professor, Cellular and Molecular Research Center, Department of Anatomy. School of Medicine, Iran University of Medical Sciences, Tehran, Iran. [6]Professor, Department of Anatomy, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.

Abstract

Background and Objective: Reduction in cerebral blood flow following cereblal ischemia cause the production of oxygen free radicals and finally leads to brain tissue destruction. Pyramidal cells of the CA1 region of hippocampus are highly sensitive to hypoxic condition. This study was done to determine the effect of human chorionic gonadotropin (hCG) and vitamine E on cellular density of CA1 hippocampal area, learning ability and memory, following ischemia - reperfusion injury in mice.

Materials and Methods: This experimental study was done on 40 male mice in 5 groups as follow: sham control, ischemia, hCG treated, vitamine E treated and hCG + vitamine E treated groups. Single dose of vitamin E was injected intraperitonaly during the establishment of reperfusion and hCG was injected from 48h after ischemia for 5 days. Folowing the treatment period, mice brains were fixated by transcardial perfusion and stained by nissle method. The shuttle box was used to evaluate the learning memory.

Results: Co-administartion of vitamine E and hCG, significantly increased the cell numbers in hippocampus compared to the ischemic group ($P<0.001$). Also learning and memory improved in treatment group in comparison with ischemia group ($P<0.05$).

Conclusion: Co-administration of vitamin E and hCG improved ischemia-induced neurodegenration and memory impairment.

Keywords: Ischemia, Reperfusion, Hippocampus, CA1 area, Human chorionic gonadotropin, Vitamine E

*** Corresponding Author: Soleimani M (PhD), E-mail: m-soleimani@sina.tums.ac.ir**

Received 25 July 2012 **Revised** 27 November 2012 **Accepted** 30 December 2012

This paper should be cited as: Babahajian A, Rasouli H, Katebi M, Sarveazad A, Soleimani M, Nobakht M. [Effect of human chorionic gonadotropin and vitamine E on cellular density of CA1 hippocampal area, learning ability and memory, following ischemia - reperfusion injury in mice]. J Gorgan Uni Med Sci. 2014; 15(4): 23-28. [Article in Persian]